

- 18 -

WHAT IS CLAIMED IS:

1. A plasma processing apparatus, comprising: a plasma processing chamber for processing therein an object to be processed;

5 antenna means for guiding microwaves into the plasma processing chamber; and

a dielectric member disposed between the antenna means and the plasma processing chamber;

10 wherein a surface of the dielectric member facing the inside of the plasma processing chamber has a projecting shape.

2. A plasma processing apparatus according to claim 1, wherein the antenna means comprises a plane antenna (RLSA) member having plural slots.

15 3. A plasma processing apparatus according to claim 1, wherein the side of the dielectric member facing the inside of the plasma processing chamber is mirror-polished.

20 4. A plasma processing apparatus according to claim 1, wherein each corner-shaped or edge-shaped portion, and/or each crossing portion (cross-type shaped portion) of the dielectric member disposed in the inside of the plasma processing chamber has a curved surface.

25 5. A plasma processing apparatus according to claim 1, wherein the projecting shape is provided along the circumferential direction, and/or radial direction of the dielectric member.

30 6. A plasma processing apparatus according to claim 1, wherein the projecting shapes are provided so that they constitute a crossing-type arrangement in the longitudinal direction, transverse direction, and /or radial direction.

35 7. A plasma processing apparatus according to claim 5, wherein the crossing portion of the projecting shape assumes a cross shape.

8. A plasma processing apparatus according to claim 6, wherein the crossing portion of the projecting

- 19 -

shape assumes a cross shape.

9. A plasma processing apparatus according to claim 5, wherein the formation of crossings of the projecting shapes is avoided.

5 10. A plasma processing apparatus according to claim 6, wherein the formation of crossings of the projecting shapes is avoided.

10 11. A plasma processing apparatus according to claim 1, wherein a plurality of projecting shapes are present, and at least some of the plural projecting shapes are mutually connected to each other.